

Key Points

1. Syrinxes can cause several types of pain which are difficult to treat
2. Study looked at whether syrinx shape influenced patient reported pain
3. Syrinxes were classified as either enlarged, deviated, or central for 20 patients with Chiari and syringomyelia
4. Pain was assessed before and after surgery
5. Pain before surgery was significantly higher for people with deviated syrinxes. People with central syrinxes reported the least pain.
6. After surgery, pain score for people with deviated syrinxes was still higher than the other two
7. Many syrinxes changed shape after surgery

Definitions

central canal - very center of the spinal cord, so named because it starts as a hollow tube which closes in most people as they age

JOA score - Japanese Orthopedic Association score; scale designed for doctors to evaluate improvement after surgery

neuropathic pain - pain due to nerve damage

spasticity - abnormally tight muscles

VAS - Visual Analog Scale; simple way to measure pain intensity from 0 - 100

cerebellar tonsils - portion of the cerebellum located at the bottom, so named because of their shape

cerebellum - part of the brain located at the bottom of the skull, near the opening to the spinal area; important for muscle control, movement, and balance

cerebrospinal fluid (CSF) - clear liquid in the brain and spinal cord,

Type of Syrinx Influences Body Pain

August 4, 2010 -- Syrinxes can cause many problems, such as loss of sensation and muscle atrophy, but the symptom most talked about by patients is by far pain. The majority of people with syringomyelia suffer from pain, which is often resistant to standard pain treatments. In addition, they may suffer from multiple types of pain, including pain from spastic muscles, biomechanical pain from loss of muscle coordination, and of course neuropathic pain. Neuropathic pain is due to nerve damage and can involve an abnormal response to something innocuous like a light touch, or even occur spontaneously.

A recent study from Japan (Ono et al.) chose to focus not on the type of pain syringomyelia patients suffer from, but rather whether the type of syrinx influenced the amount of pain patients had. In a study similar to one published earlier by Nakamura, the Japanese researchers classified syrinxes of 20 patients as either:

Enlarged - a syrinx located in the central canal, but big enough that it enlarges the central canal space

Deviated - a syrinx that bulges in one direction, most often towards what is known as the dorsal horn section of the spin

Central - a syrinx completely contained in the central canal space

Figure 1: Syrinx Types



Enlarged Deviated Central

The group was comprised of 16 women and 4 men with an average age of 49 years. All patients underwent similar decompression surgeries and were followed for an average of 4 years after surgery.

Using their syrinx classification scheme, 9 patients had enlarged syrinxes, 7 had deviated, and 4 had central. Pain was assessed the week before surgery and at the final follow-up visit using both the doctor rated Japanese Orthopedic Association score, and a simple visual scale of 0-100.

Overall, 15 of the 20 patients reported being in pain (Table 1). Interestingly, only 1 of the 4 patients with a central syrinx reported pain, while every single patient with a deviated syrinx was in pain. The most common location for pain was, not surprisingly given that most syrinxes are in the cervical part of the spine, the upper extremities (12), with a couple of people reporting pain in the chest area and lower extremities.

Table 1: Primary Pain Location (20 Patients)

Upper Extremities	12
Lower Extremities	1
Chest	2
No Pain	5

In assessing pain before surgery, the researchers found no significant difference between the syrinx types when it came to the JOA scores, but they did find a striking difference in the patient reported pain scale. Specifically, the average pain score for the deviated group was 40, or essentially double the average pain score for the enlarge group and eight times higher than the central group (Table 2). Similarly, while the average pain score when down after surgery for all groups, the deviated group still had the highest average pain score.

Table 2: Pre and Post Op VAS Scores By Syrinx Type

	# of Patients	Pre-op avg VAS	Post-op avg VAS
Enlarged	9	20.9	11.3
Deviated	7	40.7	18.4
Central	4	5	2.1

acts as a shock absorber

Chiari malformation I - condition where the cerebellar tonsils are displaced out of the skull area into the spinal area, causing compression of brain tissue and disruption of CSF flow

decompression surgery - general term used for any of several surgical techniques employed to create more space around a Chiari malformation and to relieve compression

syringomyelia - condition where a fluid filled cyst forms in the spinal cord

Source

[Surgical outcomes of foramen magnum decompression for syringomyelia associated with Chiari I malformation: relation between the location of the syrinx and body pain.](#)

Ono A, Numasawa T, Wada K, Yokoyama T, Takeuchi K, Suetsuna F, Ueyama K, Toh S. J Orthop Sci. 2010 May;15(3):299-304.

Note: Average does not include 5 patients with no pain; VAS score from 0 - 100

The researchers also found that surgery could affect the syrinx classification; in other words in some patients the type of syrinx they had changed. Of the 9 enlarged syringes prior to surgery, only 3 of them were still classified as enlarged after surgery. Four of them became deviated in shape, one became central, and one disappeared completely. Based on MRIs, the central syringes appeared to respond best to surgery with 3 of the 4 resolving completely. However, only of the original 7 deviated syringes resolved and none of the others changed in classification. As a side note, only having 5 of the syringes resolve seems low in comparison to some other publications, it is important to keep in mind that this patient group was comprised of adults and likely had had symptoms for an extended period of time.

Although this study only involved 20 patients, combined with the earlier work of Nakamura, it begins to show that the shape and location of a syrinx within the spinal cord may play an important role in whether surgery is successful from a patient point of view. As surgical outcomes research continues, Conquer Chiari hopes that researchers will also continue to further classify patients into subgroups based on certain clinical features of Chiari and syringomyelia, and begin to make real progress in identifying who is most likely to benefit from decompression surgery.

It will also be interesting to see if researchers who are focused on understanding the mechanisms of syrinx formation and growth begin to factor this into their work and try to understand why syringes form different shapes.

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